Northeastern Area
State & Private Forestry
FOREST PEST MANAGEMENT

US DEPARTMENT OF AGRICULTURE
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1973 RESURVEY FOR SIROCOCCUS SHOOT BLIGHT OF RED PINE ON THE NICOLET NATIONAL FOREST

INTRODUCTION

Sirococcus shoot blight of red pine ("Deerskin Droop") was discovered on the Nicolet National Forest in 1959 and the causal fungus, Sirococcus strobilinus Pruess, identified in 1972. The disease has also been found in Upper Michigan, northern Minnesota, Ontario, and the Adirondacks of New York.

The fungus kills the current shoots of red pine, causing the needles to wilt and droop. Fruiting bodies (pycnidia) develop on dead shoot stems or needles within a few weeks after death of the shoot. During periods of wet weather, spores are exuded from the pycnidia and are carried away in raindrops or dew which fall upon, or are windblown to healthy shoots. Seedlings under or near infected larger trees are highly vulnerable to infection and are readily killed.

On larger infected trees, six feet or more in height, the lower branches die first, and each year the killed area may appear higher on the tree. Advancement of fungus upward probably occurs as spore-laden raindrops are thrown about by infected branches moving in the wind. Trees 70 feet tall have been killed as a result.

A survey was performed in 1970 to determine the range of the disease on the Nicolet National Forest and the damage it has caused (O'Brien and Erickson, 1971). In 1973, the survey was repeated to ascertain the geographic spread of the fungus since 1970 and the intensification of the disease within infected stands.

METHODS

In 1970, six red pine stands on each district (10 on the Laona District) were examined. The stands surveyed included natural stands and plantations ranging in age from 5 - 50 years. In 1973, each stand was re-examined, except for one omitted because access to it is very difficult. Using the same techniques as in 1970, a two-man crew searching for symptoms traversed the stand along lines located in such a manner as to obtain a representative sample. If Sirococcus was found, the crew returned to the starting point and used a form of

the "nearest neighbor technique"* to estimate the percent of trees infected. Sampling points were established along the same lines as those of the detection survey. Ten consecutive points, 1/2 chain apart, were established, then a two chain interval omitted. The same pattern was continued until at least 40 trees had been examined. The nearest tree (of any species) to each point was located and it's nearest neighboring red pine examined for symptoms.

The survey crew also looked for symptoms on red pine along roads traveled in the course of the survey. When Sirococcus shoot blight was found, the location was recorded.

RESULTS AND DISCUSSION

In 1970 Sirococcus shoot blight was found in 11 of the 34 stands examined (O'Brien and Erickson, 1971). The resurvey in 1973 revealed 11 of 33 stands with infected trees (Table 1). Infection remains concentrated in the northern part of the Forest and is still present in most of the same stands that had infection in 1970. However, some changes occurred. Three stands without infected trees in 1970 now have symptomatic trees while infection has apparently disappeared in three stands (Figure 1 and Table 1). The three last stands each contained one infected sapling of poor vigor in 1970. These could have died and disappeared before, or have been missed during, the 1973 survey. One stand on the Three Lakes District could not be resurveyed because yellowing of the foliage due to another unidentified agent obscured most of the Sirococcus infection.

Infection within stands with significant infection in 1970 (8% + of the trees infected) had increased approximately three fold by 1973. It appears Sirococcus shoot blight can spread rapidly once it is well established within a stand while stand-to-stand spread is limited. The survey data indicate that at the present time Sirococcus shoot blight poses little threat to red pine stands in the southern half of the Forest. Therefore, managers establishing plantations there need not take the precautions (such as avoiding an overstory) that are necessary in the northern areas.

REFERENCES

O'Brien, James and Glen Erickson. 1971. Survey for "Deerskin Droop" of Red Pine on the Nicolet National Forest. Rpt. No. S-71-7. Available from St. Paul Field Office.

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* Method attributed to Jerome L. Clutter, University of Athens, Georgia.

Table 1. Red pine stands surveyed for Sirococcus shoot blight in 1970, 1973 - Nicolet National Forest.

District	Location			1970 Tree Age (Years)	Sirococcus Shoot Blight Found In		Percent of Trees Infected	
	T	R	S		1970	1973	1970	1973
Eagle River	40	11	35;36	25-30	x	x	20	27
	40	11	3	15	x	x	35	100
	42	11	19	20-50	x		0*	0
	42	12	19;30	25	x	x	16	53
	41	14	30	18	x	x	32	100
	40	14	7	-	x	x	8	40
Three Lakes	37	12	19	55			0	0
	38	13	12;13	3-5		(Not surveyed)	0	0
	39	14	29	20	x	x	14	(Not surveyed)
	39	13	19	25		x	0	1
	39	12	3	10			0	0
	39	11	12	40			0	0
Florence	40	14	15	20	x	x	0*	8
	40	15	11	25	x	x	0*	0*
	40	16	12	10-15			0	0
	39	15	18	20	x		0*	0
	38	16	20	18		x	0	0*
	38	15	26	10			0	0
Laona	37	15	2	30			0	0
	36	14	13	9			0	0
	36	15	15	30			0	0
	36	16	31	25	x		0*	0
	35	14	29	29			0	0
	34	14	11	33			0	0
	34	15	7	13			0	0
	35	15	11	30			0	0
	35	16	25	34		x	0	0*
	34	16	23	35			0	0
Lakewood	33	16	28	22			0	0
	33	16	1	25			0	0
	33	17	6	20			0	0
	33	17	35	25			0	0
	33	15	31	10			0	0
	33	15	14	25			0	0

*Infected trees found in detection survey only--None examined in incidence survey.

James O'Brien, Plant Pathologist
Bruce Anderson, Forest Technician

St. Paul Field Office

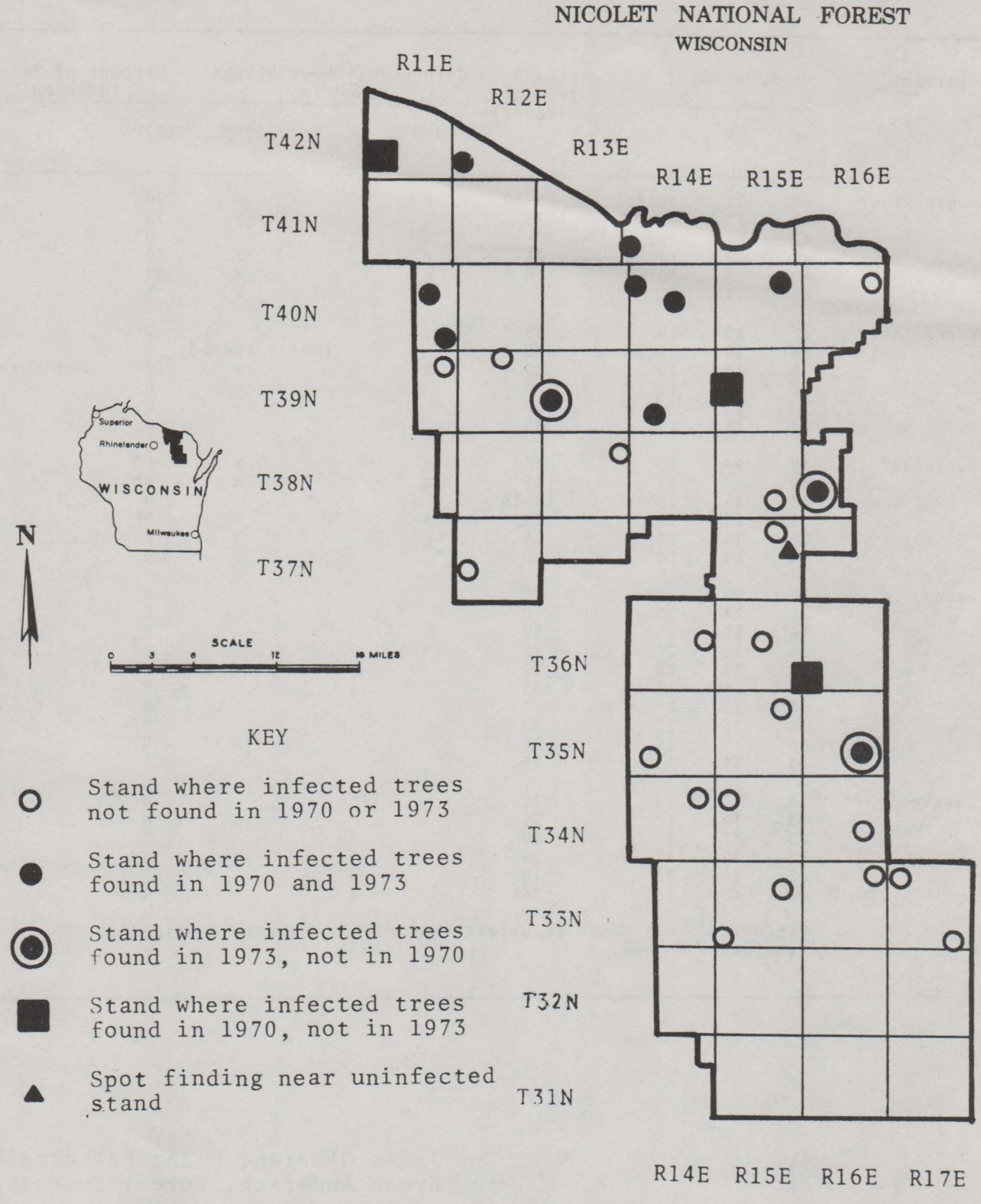

Figure I. Locations of red pine stands surveyed for Sirococcus shoot blight in 1970 and 1973.